

Science Shoebox Activity

Title: Complete and Incomplete Metamorphosis

Grade 4 Science

Content Standard 4 – Heredity

Grade Learning Expectation: GLE 0407.4.2 Differentiate between complete and incomplete metamorphosis.

State Performance Indicators: SPI 0407.4.2 Distinguish between complete and incomplete metamorphosis.

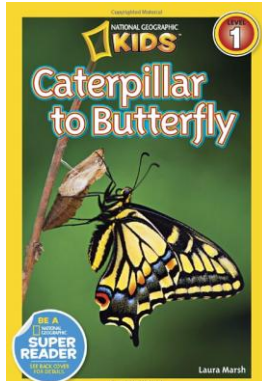
Task Objective: The students will create a craft that examines the four stages of complete metamorphosis. They will then put together two puzzles showing both types of metamorphosis. Through this they will also examine the three stages of incomplete metamorphosis. Time allowing, the student will then read the book Caterpillar to Butterfly by Laura Marsh.

Materials: paper plates, markers, ruler, glue, scissors, green construction paper, small twigs, orzo pasta, rotini, conchiglie, farfalle, puzzle pieces, and book.

Background Knowledge for Teachers: Metamorphosis occurs in nature and can be divided into two types: complete and incomplete. Complete metamorphosis has four stages and takes the creature from an egg to larva to pupa and ends in adult. There is a complete change from what the larva and pupa look like to the adult. Incomplete metamorphosis only has three stages and goes from egg to nymph to adult stage. This change is not as apparent as with complete metamorphosis. The nymph looks like a small version of the adult creature.

Across the Curriculum:

Reading: GLE 1.11 Read independently for a variety of purposes.
(Although this is a lower level book, it is full of information, great pictures, and new vocabulary.)



Language Arts: GLE 0401.1.3 Demonstrate knowledge of Standard English sentence structure. The students will use their new found knowledge to journal the answers to questions in their learning log.

Math: GLE 0406.4.1 Understand and use the properties of lines, segments, angles, polygons, and circles. Using a ruler the student will divide the plate (a circle) into four equal parts.

References:

www.differencebetween.com/difference-between-incomplete-and-vs-complete-metamorphosis

www.creekconnections.allegany.edu/Modules/On-LineActivities/AquaticMacros/LifeCycleActivity.pdf

www.mce.k12tn.net/science2/life_science_4/heredity/heredity.htm

<http://cmasescience.pbworks.com/f/Metamorphosis+PowerPoint.ppt>

www.education.com/worksheets/

Complete and Incomplete Metamorphosis Information Sheet

Metamorphosis means to undergo a change. There are two types of metamorphosis: complete and incomplete. Insects go through different stages as they grow.

Complete metamorphosis has four stages. These are egg, larva, pupa, and adult.

Incomplete metamorphosis has three stages. These are egg, nymph, and adult.

Insects first begin as eggs laid by the female. The eggs eventually hatch and either produce nymphs or larvae, depending on the insect type. If the insect is a nymph it will look like a very small version of the adult insect they will become. It will lose its exoskeleton (molt) four to eight times and then reach the adult stage with wings. If the insect is a larvae it will look very different compared to the adult it will change into. The larvae will move around, eat, and grow, then they will shed their skin a few times and move into the pupal stage. In this stage the pupae does not move around, it becomes encased, and will emerge as an adult.

Now you can get put the puzzles together! Notice the differences between complete and incomplete metamorphosis. If you still have time, read the book Caterpillar to Butterfly by Laura Marsh. The pictures are very colorful and show complete metamorphosis. Fill out your learning log as instructed. Before you leave please clean up any scrap paper, wipe up any glue, and place all the materials back into the shoebox with the direction ring on top with page one on top.

Directions for making the life cycle of a butterfly

Materials: paper plate, markers, ruler, glue, scissors, green construction paper, 4 small twigs, 3-5 pieces of orzo pasta, 1 piece rotini, 1 piece conchiglie, and 1 piece of farfalle.

Directions: Using the ruler divide the paper plate into four sections, mark with a marker. Label each section for the four stages of complete metamorphosis: egg, larva, pupa, and adult. Using the green construction paper cut out four small leaves that will fit on each section of the paper plate. Glue a twig with a leaf hanging from it in each section. Color the rotini (your caterpillar) with a magic marker. Make sure you use appropriate caterpillar colors! Color the farfalle (your butterfly) also. Now you are ready to glue. Glue a few pieces of orzo (eggs) onto the leaf in the egg section. Glue your rotini (caterpillar) in the larva section. Glue the conchiglie in the pupa section. And lastly, glue your beautiful butterfly in the adult section. You have the made the life cycle of a butterfly!

Please clean up any scrap paper, wipe up any glue, and place all the materials back into the shoebox with the direction ring on top with page one on top.

Now let's see what we have learned! Answer these questions in your learning log.

1. What does metamorphosis mean?
2. How many types of metamorphosis are there?
3. Can you name the stages in each?
4. Name three insects that belong to each group.

